# 1AC- Patents – TOC -- Nirmal

## 1AC

### 1AC- Biotech

#### Current patent rule incentivize universities to patent and use high prices for medical inventions

**Gold 10** [Gold ER, Kaplan W, Orbinski J, Harland-Logan S, N-Marandi S. Are Patents Impeding Medical Care and Innovation? PLoS Medicine. 2010;7(1):e1000208. doi:10.1371/journal.pmed.1000208. ] NB

The narrowest version of the question focuses on the effect of existing patents held by actors (industry, university, government laboratories, etc.) on medical care and innovation.

In high-income countries, the evidence suggests that existing patents increase the cost of medicines [[1]](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2795161/#pmed.1000208-Saha1). Whether patents increase the cost of other services, such as diagnostics, is unclear [[2]](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2795161/#pmed.1000208-CookDeegan1). For example, in their recent analysis of patents on genetic testing, Robert Cook-Deegan and colleagues concluded that “prices of patented and exclusively licensed tests are not dramatically or consistently higher than those of tests without a monopoly” [[2]](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2795161/#pmed.1000208-CookDeegan1). What impact do existing patents have on the total cost of medical care in rich countries? Again, the evidence is unclear. Patents could conceivably reduce the total cost of care if new patented medicines turn out to be cheaper than existing medical interventions. In those low- and middle-income countries in which current medications are subject to patent rights, existing patents seem to make medicines more expensive and increase the difficulty of creating novel mechanisms through which to deliver medicines [[3]](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2795161/#pmed.1000208-Gold1),[[4]](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2795161/#pmed.1000208-Attaran1). In all countries, existing patents make research and development more expensive for the simple reason that researchers and companies must clear patent rights to do their work. Whether this cost is offset by other benefits is a subject I turn to next.

#### Patents empirically decrease innovation rates in biotech

**Gold 10** [Gold ER, Kaplan W, Orbinski J, Harland-Logan S, N-Marandi S. Are Patents Impeding Medical Care and Innovation? PLoS Medicine. 2010;7(1):e1000208. doi:10.1371/journal.pmed.1000208. ] NB

The theory underlying patent rights is that patents encourage people to invest in bringing a compound through clinical trials and into practice [[5]](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2795161/#pmed.1000208-Grabowski1),[[6]](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2795161/#pmed.1000208-Kieff1). The prospect of future patents may, therefore, increase innovation today and may increase medical care by encouraging manufacturers to introduce new medicines [[7]](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2795161/#pmed.1000208-Gagnon1). While pharmaceutical companies spend almost twice as much on marketing than on research [[8]](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2795161/#pmed.1000208-Lanjouw1), they nevertheless invest heavily in developing new medicines. Two questions remain, however. First, while patents provide an incentive to bring a new product to market, are these incentives better than those provided by alternative mechanisms? We know that existing business strategies of both pharmaceutical and biotechnology companies rely heavily on patents [[6]](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2795161/#pmed.1000208-Kieff1),[[9]](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2795161/#pmed.1000208-Munos1), but this does not prove that they could not have developed strategies that did not rely on patents. It appears that the biomedical industry's reliance on patents is historically arbitrary [[10]](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2795161/#pmed.1000208-Hall1), rather than being necessary to spur innovation. So, for example, would a prize awarded to those who discover new medicines be a better mechanism than using patents [[11]](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2795161/#pmed.1000208-Love1)? Neither theory nor evidence provides a clear answer. Second, are the benefits of patents in encouraging the development of new medicines offset by the increased prices we pay for existing medicines and by the higher fees that researchers must pay? Again, empirical research is inconclusive but is strongest in the biomedical sector [[10]](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2795161/#pmed.1000208-Hall1). In the end, we have no better answer today than in the 1950s when economists Edith Penrose and Fritz Machlup concluded that the evidence supporting or undermining the patent system is lacking [[12]](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2795161/#pmed.1000208-Penrose1),[[13]](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2795161/#pmed.1000208-Machlup1). How Is The Patent System Impeding Medical Care and Innovation? If we look at the outcomes of biomedical innovation, a different answer emerges. The patent system—not just patent rights but how they are obtained and used—has resulted in an innovation system characterized by a dramatic increase in health care costs and decreasing (quantitatively and qualitatively) levels of innovation, especially by dollar spent [[9]](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2795161/#pmed.1000208-Munos1). While one cannot say that these problems are inherent in patent law they are, nevertheless, an outcome of the manner in which actors deploy patent rights. The evidence points to a crisis in biomedical innovation even if not to a solution. While health care costs are increasing rapidly, the fastest growing component of those costs are pharmaceutical products [[14]](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2795161/#pmed.1000208-Canadian1). The costs of developing a new medicine from discovery through clinical trials appear to double every decade [[15]](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2795161/#pmed.1000208-DiMasi1). Yet, despite increasing investments in research and development, industry is producing fewer new drugs every year of which a declining percentage is truly innovative [[16]](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2795161/#pmed.1000208-Gagnon2). Beyond this, investments in the health needs of developing countries remains very low by any standard, and patents continue to get in the way of modifying existing medicines for the needs of those countries [[3]](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2795161/#pmed.1000208-Gold1). All of this shows an industry in serious difficulty and a health care system facing unsustainable cost increases and fewer new products. There are many reasons for this crisis that stretch well beyond the patent system. To the extent, however, that the industry's current business models are build around patents, the patent system itself must shoulder its share of responsibility.

#### Patent protections for universities cause increased drug prices and risks failures in tech from not being spotted

**Patino 10** [Patino, Robert M. “Moving Research to Patient Applications through Commercialization: Understanding and Evaluating the Role of Intellectual Property.” Journal of the American Association for Laboratory Animal Science : JAALAS 49.2 (2010): 147–154. Print. ] NB

The use of intellectual property rights to advance healthcare technologies obviously brings financial returns to the university and inventor, yet several economic realities engender disadvantages in terms of the use of patent protection for healthcare advances. One of the most prominent arguments is the relationship of patents to the rising cost of healthcare. For example, drug patents cause market inhibition by preventing less-expensive generic formulations from entering the market. The rise in healthcare costs, whether related to patents or other medical service inefficiencies, continues to outpace the growth in inflation and the growth in the gross domestic product of the United States.[5](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2846000/#bib5) These soaring healthcare costs create additional burdens on companies trying to retain talent in their workforce. General Motors, for example, which spent $4.8 billion on healthcare for its employees in 2006, was a strong advocate for a bill that promoted the availability of generic drugs.[12](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2846000/#bib12) Large pharmaceutical companies hold a different perspective toward loosening the intellectual property grip on technology or access to information rights, arguing that these protections expedite bringing new treatments into the healthcare market. Their data commonly are protected by trade secret or copyright claims that prevent sharing such information without the agreement of the owner. Industry currently has little incentive to share their data with a competitor or generic pharmaceutical company if those data would enhance the approval process for a competing drug. However, some members of the research community and legal experts believe that public access to scientific information held by the FDA and industry would help curb costly repeat failures of common etiologies.[13](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2846000/#bib13)

#### Patents skew biomedical research towards only problems in the rich world

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For developing countries, patents can impede medical care by pricing medicines and other health care technologies (HCTs) out of the reach of patients or their health care systems. Pharmaceutical companies have little interest in pricing drugs for developing country markets because they are seeking to maximize global not national profits, and do not want to set a low price precedent that would increase demand in wealthy countries for similar low prices [[41]](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2795161/#pmed.1000208-United1). For those with a purchasing power less than what is needed to meet minimal needs—i.e., most of the 3.8 billion people who live on less than US$2 per day [[42]](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2795161/#pmed.1000208-World2)—access to HCTs is little more than a discomforting dream. Further, if a treatment is too expensive, other factors that can affect medicines availability, such as drug distribution systems and rational drug use policies, become moot. Indeed, it was only when generic competition lowered the price of antiretroviral therapy for HIV—from more than US$15,000 per patient per year in 2001 to less than US$99 in 2007—that the policy debate shifted from whether such therapy was possible in resource-poor settings to how to strengthen health infrastructure to provide comprehensive HIV health care for people in such settings [[43]](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2795161/#pmed.1000208-Mdecins1),[[44]](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2795161/#pmed.1000208-Kim1). To increase access to existing HCTs, governments can make use of fully legal safety provisions of the World Trade Organization's Trade in Intellectual Property Rights Agreement (TRIPS). These provisions include compulsory licensing, which allows a government to force a drug company to license its patent to a local generic producer who must pay a royalty to the patent holder. But a government is allowed to issue a compulsory license only after price negotiations with the patent holder have failed. Nevertheless, compulsory licensing remains a valuable tool, as memorably shown in 2001 when South Africa issued compulsory licenses to produce selected anttiretroviral drugs. Although 39 pharmaceutical companies attempted to sue South Africa's government for allegedly infringing on their patent rights, they ultimately chose to withdraw this lawsuit in the face of immense public pressure [[45]](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2795161/#pmed.1000208-Agovino1). The confrontation led the World Trade Organization to issue its November 2001 Doha Declaration, which affirmed that “the TRIPS Agreement does not and should not prevent members from taking measures to protect public health” [[46]](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2795161/#pmed.1000208-DOHA1). Current patent laws also skew biomedical research to products that yield high profits rather than to global priority health needs in both developed and developing countries. Currently, malaria, pneumonia, diarrhea, and tuberculosis, which together account for 21% of the global disease burden, receive 0.31% of all public and private funds devoted to heath research [[47]](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2795161/#pmed.1000208-Pogge1),[[48]](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2795161/#pmed.1000208-Orbinski1). More than 1 billion people—the overwhelming majority of whom are in the developing world—suffer from neglected tropical diseases, those for which there are inadequate or nonexistent treatments and a paucity of research and development [[49]](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2795161/#pmed.1000208-Savioli1). Of the 1,556 new pharmaceutical compounds that appeared on the market between 1975 and 2004, just twenty of these

#### Industry relies on university for innovative discoveries

- Also no links an innovation DA- university researchers are consistently paid for outputting new ideas, tech transfer only occurs after they’ve came up with innovative tech

**Patino 10** [Patino, Robert M. “Moving Research to Patient Applications through Commercialization: Understanding and Evaluating the Role of Intellectual Property.” Journal of the American Association for Laboratory Animal Science : JAALAS 49.2 (2010): 147–154. Print. ] NB

Industry is relying increasingly on academia as a leading source of new drug and medical device discoveries that develop through basic research or cross-disciplinary collaborations.[11](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2846000/#bib11) This phenomenon can be attributed to a multitude of factors, including the high cost of gaining approval from the Food and Drug Administration (FDA), the need to add more products to pipelines as existing patents for drugs and devices expire, the desire to minimize out-of-pocket costs for failed internal research, and academia's ability to bring multiple resources together from disciplines outside of the medical field to develop novel solutions to various health problems. If the cost of failed drugs is included in the equation, the total research and development cost estimate of taking a single drug from phase I clinical trials to approval exceeds $800 million.[24](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2846000/#bib24) Reflecting these hurdles, only 17 new chemical entities were approved by the FDA in 2007.[10](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2846000/#bib10) The number of annual drug approvals has been in general decline over the past 13 y; although generally more than 30 drugs were approved annually between 1996 to 1998, no more than 20 were approved annually between 2005 to 2007.[27](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2846000/#bib27) Drug discovery and early-stage development are relegated increasingly to smaller drug and biotechnology companies that have little to no revenue stream relative to their operating costs, with legacy pharmaceutical companies that have achieved a sustainable profitability record focusing on later stages of the process. By seeking peer-reviewed, emerging discoveries that are reported in journal articles, conference presentations, and academic centers, biotech companies mitigate the investment risks associated with technology discovery and early-stage development. However, as a result of taking this approach, pharmaceutical companies must pay more to acquire commercialization rights for technologies that have already progressed through conception and into early-stage development. Selling the rights to products at this stage can provide an attractive return on investment for small biotech companies that lack the resources or are unwilling to take the financial risk of advancing a new drug into the realm of clinical trials. The pharmaceutical company Pfizer is one example of how legacy pharmaceutical companies are adjusting to the new economic challenges. In January 2009, Pfizer announced its plans to eliminate as much as 8% of its research jobs worldwide and raise productivity by relying on partnerships, licensing, and mergers and acquisitions to efficiently bring late-stage pipeline drugs to market.[25](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2846000/#bib25) These actions allow Pfizer to focus on strategic therapeutic areas such as cancer, Alzheimer disease, and pain by managing the later phases of drug to market activities rather than earlier stage, high-risk discovery endeavors. Academic and healthcare administrators should be knowledgeable regarding the complexities that surround such interactions with industry. Most technology-leveraged companies that rely on their intellectual assets to define their financial net worth seek intellectual property rights to gain control of and protect their investment interests in technologies acquired from academic institutions and other research arenas. Intellectual property rights consist of patents, copyrights, know-how, trade secrets, trademarks, trade dress, and service marks ([Figure 1](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2846000/figure/fig1/" \t "figure)). The value of intellectual property rights is tremendous. For example, in the United States, intellectual property assets are estimated to underlie about 45% of the gross domestic product.[26](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2846000/#bib26) Appropriate management of technology transfer is essential to ensuring that research conducted at universities and similar institutions advances to become useable products or service. Without sufficient attention to securing and negotiating intellectual property rights, the inventor institution may be outmaneuvered in a technology-transfer negotiation, inadvertently giving away valuable information or missing opportunities entirely. For example, a few decades ago, Sutter Health hospital in northern California employed a dermatologist who formulated the idea of using botulinum toxin to plump thin lips and smooth out wrinkles, but the hospital did not file a patent.[21](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2846000/#bib21) In 2007, Allergan grossed $1.2 billion in sales from Botox based on the same idea.[21](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2846000/#bib21) With appropriate management of intellectual property, Sutter Health hospital could have secured a royalty share on those sales.

#### Bioterror agent development crucial to deter potential bioterror attacks- empirics prove

**Kosal 14** [Kosal Margaret (US National Library of Medicine. National Institutes of Health Published). A New Role for Public Health in Bioterrorism Deterrence. Frontiers in Public Health. 2014;2:278. doi:10.3389/fpubh.2014.00278.] NB

The threat of inflicting punishing retaliation against some aggressor, not the ability to prevent some hostile act from occurring, is the core of traditional deterrence theory. Within new deterrence approaches in political science, however, there are several types of definable strategies that may be applied to bioterrorism by foreign actors ([11](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4261597/#B11)). Indirect deterrence focuses on third party players and their roles in terrorist attacks. Third parties are most typically state sponsors or supporting financiers. This concept is based on the recognition that while a terrorist may be willing to die for his cause, it is less likely that explicit and tacit supporters are willing to pay a similar retribution. Appealing to or directing bioterrorism deterrence efforts toward tacit supporters is an untapped area. Collective actor deterrence utilizes the power and influence of institutions like the United Nations, NATO, or other broad coalitions to deter terrorist actions, highlighting the legitimacy of the organization and the international community rather than the interests of a single state. For bioterrorism, the WHO and African Union’s disease eradication efforts are examples. Internalized deterrence plays off the psyche of a terrorist, combining abstract concepts of criminology and social constructivism to subconsciously deter a terrorist through social taboos and norms ([12](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4261597/#B12), [13](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4261597/#B13)). This might involve leveraging fear of disease spreading to oneself or one’s own community. Tailored deterrence attempts to individualize each situation to reach the best possible solution, leveraging cultural, political, social, and other specific knowledge. These newer deterrence strategies offer opportunities for dealing with bioterrorism threats by foreign actors, which could be combined with public health information and resources. In thinking about public health infrastructure as an active or passive part of new deterrence strategies, it is useful to think about the role of missile defense. As the presence of a ballistic missile defense system is supposed to be an existential deterrent itself, so could be a strong public health system. Missile defense is both a passive deterrent and, if used, an active deterrent, as it stops something from occurring. A strong public health infrastructure is likely to be the key in reducing the vulnerability to bioterrorism attack, as well as having a potential role in deterring a foreign terrorist group from even considering such an attacks. If foreign terrorists are also aware of the weak public health infrastructure with their own borders, and the increased risks to them and their publics in the event of an accident in developing biological weapons and/or spread of an infectious disease that they might launch, this may also deter them from pursuing this work. In addition, even the accidental release of a dangerous pathogen or the spread of an infectious disease via attack will most likely cause disproportional negative effects to nations with limited public health infrastructures and affect tacit and explicit supporters in those states. The role of a robust public healthcare system for its deterrence capacity can be explored through empirically driven case study methods against predominant theories of deterrence in political science ([14](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4261597/#B14), [15](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4261597/#B15)) and in comparison to other works considering the possibility of deterring bioterrorism ([16](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4261597/#B16)–[20](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4261597/#B20)). For example, the re-emergence of polio offers a potentially useful example to think about the effects of a potential bioterrorist attack on the developed and the developing world. Polio is both a contagious infectious disease and transmissible from human-to-human (like smallpox and plague). The poliovirus is highly transmissible with a basic reproductive rate or secondary transmission rate (R0) exceeding most suspected biological agents, e.g., standard estimates of R0 for polio range from 5 to 7 ([21](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4261597/#B21), [22](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4261597/#B22)), whereas R0 for suspected bioterrorist agents like smallpox (1.8–3.2) ([23](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4261597/#B23)–[25](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4261597/#B25)); pneumonic plague (0.8–3.0) ([26](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4261597/#B26), [27](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4261597/#B27)); and even Ebola (1.34–2.0) ([28](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4261597/#B28), [29](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4261597/#B29)) are lower. It is not a likely biological terrorism agent, however, due to the low-mortality associated with infection. It is, however, a useful model for thinking about the spread of infectious disease and the importance of a robust public health infrastructure as a deterrence strategy. At the beginning of 2003, the complete eradication of polio appeared to be within the grasp of the World Health Association and its many partners. In 1998, the World Health Organization estimated there were over 365,000 new cases of polio; by early 2003, the rate of infection had declined to <1,000 new cases worldwide due to a vigilant vaccination effort ([30](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4261597/#B30)). That trend was interrupted, however, when Nigerian citizens refused to be vaccinated after hearing unfounded allegations of contaminated vaccines that would lead to sterility or cause HIV/AIDs. Before 2003, polio had largely been confined to only a handful of countries; Nigeria, India, Pakistan, and Afghanistan accounted for 93% of the world’s cases ([31](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4261597/#B31)). What started with the refusal of local clerics to allow vaccination led to the reestablishment or importation of the poliovirus to 14 countries that were previously disease-free. Transport of the contagious virus was not limited to neighboring African states. The poliovirus moved through Sudan to Ethiopia crossing the Red Sea to Lebanon and Yemen. The latter was been particularly severely affected, witnessing more than 500 new cases in the first half of 2005. The poliovirus spread as far as Indonesia, where it afflicted more than 150 people in a single year in 2 provinces, predominantly children ([32](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4261597/#B32)). Prior to this outbreak, Indonesia had been polio free for nine years. Genetic fingerprinting confirmed that the strain imported to Indonesia came from northern Nigeria through Sudan, most closely resembling an isolate recovered in Saudi Arabia in December 2004. A pilgrim returning from Mecca or a returning foreign worker is suspected to have brought the virus to the island of Java, across an ocean and thousands of miles from its source. The polio virus continues to persist in a limited number of states in the developing world, specifically in Nigeria, Afghanistan, and Pakistan, where a ban on vaccination by Islamist leaders in Waziristan remains in place. Since 2013, polio (linked genetically to the strain in Pakistan) has spread from Syria to Iraq ([33](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4261597/#B33)). Countries that have witnessed the re-emergence of poliovirus outbreaks have some crucial links: social and political challenges that have impeded the development and implementation of appropriate public health infrastructures and measures. Not unexpectedly, there is an inverse relationship between government health expenditure in health and number of polio cases. Looking at the spread of polio can provide us with a lens to think about the impacts of bioterrorism in states with developed public health infrastructures and those who do not. A bioterrorist attack, especially one with a contagious agent like smallpox or pneumonic plague, will likely impact the developing parts of the world substantially more than the US. One only has to look as far as polio’s re-emergence (or more recently the outbreak of Ebola virus disease in West Africa) to see the very real repercussions of a contagious virus and how the most dire causes and effects of infection and spread stem from poor public health infrastructures ([34](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4261597/#B34)). Creating a new deterrence strategy for bioterrorism is needed. Credibly, communicating the differential capacities to respond and the comparative likely outcomes will require diplomacy, coordination with civil affairs, specialized knowledge of individual states, and regions of the developing world. These are fundamentally interdisciplinary efforts that should leverage small teams from diplomatic, development, public health, and defense communities. One single parochial voice will be inadequate. Further improving the US domestic public health infrastructure would be beneficial and cost effective regardless of whether an outbreak is intentional or natural. The devastating Ebola outbreaks serve as a call for urgent investment in public health infrastructures worldwide, to provide both responsive and proactive actions to deter bioterrorism and to deal with natural disease outbreaks. Public health remains a powerful and often underutilized asset for bioweapons defense through vulnerability reduction; leveraging public health may also enable new approaches to deterring bioterrorism threats. International security scholars would benefit from better understanding of and leveraging the knowledge of the public health community

#### Disease outbreaks risk extinction

**Myhrvold 13** [Nathan, PhD in Theoretical and Mathematical Physics from Princeton, and founded Intellectual Ventures after retiring as Chief Strategist and Chief Technology Officer of Microsoft Corporation, July, "Stratgic Terrorism: A Call to Action," http://www.lawfareblog.com/wp-content/uploads/2013/07/Strategic-Terrorism-Myhrvold-7-3-2013.pdf]

A virus genetically engineered to infect its host quickly, to generate symptoms slowly—say, only after weeks or months—and to spread easily through the air or by casual contact would be vastly more devastating than HIV. It could silently penetrate the population to unleash its deadly effects suddenly. This type of epidemic would be almost impossible to combat because most of the infections would occur before the epidemic became obvious. A technologically sophisticated terrorist group could develop such a virus and kill a large part of humanity with it. Indeed, terrorists may not have to develop it themselves: some scientist may do so first and publish the details. Given the rate at which biologists are making discoveries about viruses and the immune system, at some point in the near future, someone may create artificial pathogens that could drive the human race to extinction. Indeed, a detailed species-elimination plan of this nature was openly proposed in a scientific journal. The ostensible purpose of that particular research was to suggest a way to extirpate the malaria mosquito, but similar techniques could be directed toward humans.16 When I’ve talked to molecular biologists about this method, they are quick to point out that it is slow and easily detectable and could be fought with biotech remedies. If you challenge them to come up with improvements to the suggested attack plan, however, they have plenty of ideas. Modern biotechnology will soon be capable, if it is not already, of bringing about the demise of the human race— or at least of killing a sufficient number of people to end high-tech civilization and set humanity back 1,000 years or more. That terrorist groups could achieve this level of technological sophistication may seem far-fetched, but keep in mind that it takes only a handful of individuals to accomplish these tasks. Never has lethal power of this potency been accessible to so few, so easily. Even more dramatically than nuclear proliferation, modern biological science has frighteningly undermined the correlation between the lethality of a weapon and its cost, a fundamentally stabilizing mechanism throughout history. Access to extremely lethal agents—lethal enough to exterminate Homo sapiens—will be available to anybody with a solid background in biology, terrorists included. The 9/11 attacks involved at least four pilots, each of whom had sufficient education to enroll in flight schools and complete several years of training. Bin laden had a degree in civil engineering. Mohammed Atta attended a German university, where he earned a master’s degree in urban planning—not a field he likely chose for its relevance to terrorism. A future set of terrorists could just as easily be students of molecular biology who enter their studies innocently enough but later put their skills to homicidal use. Hundreds of universities in Europe and Asia have curricula sufficient to train people in the skills necessary to make a sophisticated biological weapon, and hundreds more in the United States accept students from all over the world. Thus it seems likely that sometime in the near future a small band of terrorists, or even a single misanthropic individual, will overcome our best defenses and do something truly terrible, such as fashion a bioweapon that could kill millions or even billions of people. Indeed, the creation of such weapons within the next 20 years seems to be a virtual certainty. The repercussions of their use are hard to estimate. One approach is to look at how the scale of destruction they may cause compares with that of other calamities that the human race has faced.

#### Biomedical research improves food resources, environment and medicine

**Keasling 13** [Jay Keasling, 2-28-2013, "Why Synthetic Biology Is the Field of the Future — NOVA Next," NOVA Next, <http://www.pbs.org/wgbh/nova/next/tech/why-synthetic-biology-is-the-field-of-the-future/>] NB

Most Americans may not be familiar with synthetic biology, but they may come to appreciate its advances someday soon. Synthetic biology focuses on creating technologies for designing and building biological organisms. A multidisciplinary effort, it calls biologists, engineers, software developers, and others to collaborate on finding ways to understand how genetic parts work together, and then to combine them to produce useful applications. Synthetic biology is a relatively young field, begun only about ten years ago. But in that time, we have made some astonishing progress. This is due, in part, to the enormous improvements in our ability to synthesize and sequence DNA. But we’ve also gained a much greater understanding of how the various parts of the genome interact. We now can reliably combine various genetic pieces to produce a range of consumer products, from biofuels to cosmetics. In medicine, the synthetic biology community is pushing the boundaries by designing microbes that will seek and destroy tumors in the body before self-destructing. Synthetic biology also provides us a way to clean up our environment. We can build organisms to consume toxic chemicals in water or soil that would not otherwise decompose, for example. It can also help us to better understand flu strains and create vaccines. Synthetic biology will even help us feed the world. At MIT, researchers are working to build a process that will allow plants to fix nitrogen. If successful, farmers will no longer require fertilizer for their crops. That’s not all we’re doing with plants, either. At the Joint BioEnergy Institute in California, scientists have found a way to expand the sugar content of biomass crops to increase their density and decrease the cost of biofuels produced from them. We envision that eventually we will be able to build just about anything from biology. Don’t be surprised if one day your computer has biological parts The recently released [National Bioeconomy Blueprint](http://www.whitehouse.gov/blog/2012/04/26/national-bioeconomy-blueprint-released" \t "_blank) notes that the field is already making an important contribution to the U.S.’s technological innovation and will be a key to our shift to a bioeconomy, or economic activity powered by research and innovation in the biosciences. We still have many challenges to overcome, but we have laid a very strong foundation for the field. We believe that one day we will be able to fully utilize biology’s manufacturing capability. As one of my colleagues, Harvard scientist Pam Silver noted, the field is poised to explode, both in terms of what scientists can accomplish and what the public realizes is possible. A Significant Advancement A landmark of synthetic biology will launch this spring. It is an anti-malarial drug made from synthetic chemicals, artemisinin. It’s an important event for those threatened by the disease; each year, malaria kills more than one million people and infects an additional 300–500 million people. That’s over seven percent of the world’s population. Artimisinin is not a new treatment for malaria, but our ability to produce the substance in a lab is. Traditionally, the drug is isolated from a plant, Artemisia annua. But by moving production into the lab, we’re liberated from the vicissitudes of the plant’s growth cycle as well as the fluctuations in global supplies and prices. Artemisinin is a milestone in science, too. It represents a watershed moment in particular for the emerging field of synthetic biology. Managing the Risks Like many things we do, synthetic biology comes with risks, especially when it comes to safety and security. But consider this: We fly airplanes, we drive cars, we treat cancer with poison— all of these activities could be dangerous, but they also have benefits that far outweigh the risks. We believe this is true of synthetic biology as well. As Laurie Zoloth, a bioethicist at Northwestern University, [once said](http://usatoday30.usatoday.com/tech/science/genetics/2005-08-18-synthetic-biologists_x.htm" \t "_blank), “Synthetic biology is like iron: You can make sewing needles and you can make spears. Of course, there is going to be dual use.” Here, I would say that synthetic biology has learned much from the past—at conferences such as Asilomar, we carefully considered how we can pursue our research responsibly. We work closely with regulatory agencies and adhere to our own institutional requirements. In fact, much of our work is with what are called Biosafety Level 1 organisms—the safest organisms known. We also have developed a robust partnership with the FBI to ensure that we are utilizing the best practices for lab security. In addition to discussing approaches to risk and risk assessment, synthetic biologists are also working hard to minimize potential adverse effects. For example, Silver’s lab is working to create genetic self-destruct traits, termed “auto-delete,” as a way to ensure that genetically modified organisms don’t escape into the environment. Along with the practical matters of safety and security, there are profound moral and ethical issues involved in our research. Many of us, especially our colleagues at the Hastings Center and the Wilson Center, are grappling with building a framework for all of us to use in our work. There are no easy answers, but I can assure you that we all want our work to benefit the public, solving global challenges, and making sure that we are well-equipped to live in the future bioeconomy.

#### Food security risks global conflict

**Headley 13** [(Joshua, founder of Deep Green Resistance environmental movement) “BREAKDOWN: Industrial Agriculture” Deep Green Resistance May 12 2013] AT

In no other industry today is it more obvious to see the culmination of affects of social, political, economic, and ecological instability than in the global production of food. As a defining characteristic of civilization itself, it is no wonder why scientists today are closely monitoring the industrial agricultural system and its ability (or lack thereof) to meet the demands of an expanding global population. Amidst soil degradation, resource depletion, rising global temperatures, severe climate disruptions such as floods and droughts, ocean acidification, rapidly decreasing biodiversity, and the threat of irreversible climatic change, food production is perhaps more vulnerable today than ever in our history. Currently, as many as 2 billion people are estimated to be living in hunger – but that number is set to dramatically escalate, creating a reality in which massive starvation, on an inconceivable scale, is inevitable. With these converging crises, we can readily see within agriculture and food production that our global industrial civilization is experiencing a decline in complexity that it cannot adequately remediate, thus increasing our vulnerability to collapse. Industrial agriculture has reached the point of declining marginal returns – there may be years of fluctuation in global food production but we are unlikely to ever reach peak levels again in the foreseeable future. While often articulated that technological innovation could present near-term solutions, advocates of this thought tend to forget almost completely the various contributing factors to declining returns that cannot be resolved in such a manner. There is also much evidence, within agriculture’s own history, that a given technology that has the potential to increase yields and production (such as the advent of the plow or discovery of oil) tends to, over time, actually reduce that potential and significantly escalate the problem. Peak Soil A largely overlooked problem is soil fertility. [1] A civilization dependent on agriculture can only “sustain” itself and “progress,” for as long as the landbase and soil on which it depends can continue to thrive. The landscape of the world today should act as a blatant reminder of this fact. What comes to mind when you think of Iraq? Cedar forests so thick that sunlight never touches the ground? “The Fertile Crescent,” as this region is also known, is the cradle of civilization and if we take a look at it today we can quickly deduce that overexploitation of the land and soil is inherent to this way of life. The Sahara Desert also serves as a pressing example – a region once used by the Roman Empire for food cultivation and production. But this problem has not escaped our modern industrial civilization either, even despite some technological advances that have been successful at concealing it. The only thing we have genuinely been “successful” at is postponing the inevitable. Currently, industrial agriculture depletes the soil about a millimeter per year, which is ten times greater than the rate of soil formation. Over the last century, we have solved this problem by increasing the amount of land under cultivation and by the use of fertilizers, pesticides, and crop varieties. Industrial civilization has expanded so greatly, however, that we currently already use most of the world’s arable land for agriculture. To solve the problems of peak soil today, as we have previously, would require doubling the land currently used for cultivation at the cost of some of the worlds last remaining forests and grasslands – most notably the Amazon and the Sahel. Not only is this option impractical, given the current state of the climate, it is wholly insane. Another problem we face today is that more than a half-century of reliance on fertilizers and pesticides has severely reduced the level of organic matter in the soil. An advance in chemical fertilizers and/or genetic engineering of crops, while promising boosted yields in the near-term, will only further delay the problem while at the same time possibly introducing even greater health risks and other unforeseen consequences. Decreasing Yields & Reserve Stocks According to an Earth Policy Institute report in January, global grain harvests and stocks fell dangerously low in 2012 with total grain production down 75 million tons from the record year before. [2] Most of this decrease in production occurred as a result of the devastating drought that affected nearly every major agricultural region in the world. The United States – the largest producer of corn (the world’s largest crop) – has yet to fully recover from the drought last year and this is a cause for major concern. Overall, global grain consumption last year exceeded global production requiring a large dependence on the world’s diminishing reserve stocks. And this isn’t the first time it has happened – 8 out of the last 13 years have seen consumption exceed production. In an escalating ecological crisis this is likely to be the new “normal.” This fact, in itself, is a strong indication that industrial civilization is dangerously vulnerable to collapse. The issue here is two-fold: resource scarcity (industrial agriculture requires fossil fuels in every step of the process), soil degradation, and climate disruptions (droughts, floods, etc.) are severely reducing the yields of industrial agriculture; at the same time (and precisely because of those facts), we are becoming increasingly reliant on carryover reserve stocks of grains to meet current demands thus creating a situation in which we have little to no capacity to rebuild those stocks. As Joseph Tainter describes in The Collapse of Complex Societies, a society becomes vulnerable to collapse when investment in complexity begins to yield a declining marginal return. Stress and perturbation are common (and constant) features of all complex societies and they are precisely organized at high levels of complexity in order to deal with those problems. However, major, unexpected stress surges (which do occur given enough time) require the society to have some kind of net reserve, such as excess productive capacities or hoarded surpluses – without such a reserve, massive perturbations cannot be accommodated. He continues: “Excess productive capacity will at some point be used up, and accumulated surpluses allocated to current operating needs. There is, then, little or no surplus with which to counter major adversities. Unexpected stress surges must be dealt with out of the current operating budget, often ineffectually, and always to the detriment of the system as a whole. Even if the stress is successfully met, the society is weakened in the process, and made even more vulnerable to the next crisis. Once a complex society develops the vulnerabilities of declining marginal returns, collapse may merely require sufficient passage of time to render probable the occurrence of an insurmountable calamity.” [3] Current global reserve stocks of grains stand at approximately 423 million tons, enough to cover 68 days of consumption. As population and consumption levels continue to rise while productive capacities fall, we will be more and more dependent on these shrinking reserves making our ability to address future stresses to the system significantly low. Disappearance of the Arctic Sea Ice One such “insurmountable calamity,” may be quickly on the horizon. This week, senior US government officials were briefed at the White House on the danger of an ice-free Arctic in the summer within two years. One of the leading scientists advising the officials is marine scientist Professor Carlos Duante, who warned in early April: “The Arctic situation is snowballing: dangerous changes in the Arctic derived from accumulated anthropogenic green house gases lead to more activities conducive to further greenhouse gas emissions. This situation has the momentum of a runaway train.” [4] Over the last few years, the excessive melting occurring in the Arctic region due to rising global temperatures has altered the jet stream over North America, Europe, and Russia leading to the very unprecedented heat waves and droughts responsible for most of the declining returns in agricultural production in recent years. As the warming and melting continue, these extreme weather events will exponentially get worse. In addition, the melting of the sea ice will significantly raise sea level with the potential to displace more than 400 million people. The UK-based Arctic Methane Emergency Group recently released a public statement also indicating: “The weather extremes from last year are causing real problems for farmers, not only in the UK, but in the US and many grain-producing countries. World food production can be expected to decline, with mass starvation inevitable. The price of food will rise inexorably, producing global unrest and making food security even more of an issue.” [5] Social, Political, and Economic Instability No civilization can avoid collapse if it fails to feed its population, largely because continued pressures on the system will result in the disintegration of central control as global conflicts arise over scarce necessities. [6] This process can occur rapidly and/or through a gradual breakdown. A likely scenario of rapid collapse would be the breakout of a small regional nuclear war – such as between Pakistan and India – which would create a “nuclear winter” with massive global consequences. If that could be avoided, then the threat of collapse will likely be more gradual through the continued decrease of marginal returns on food and essential services. As these crises continue to increase in frequency and severity, their convergences will usher in a period of prolonged global unrest. [7] This was directly seen as a result of the 2007-08 grain crisis in which many countries restricted exports, prices skyrocketed, and food riots broke out in dozens of countries. Many of those countries were located within the Middle East and are credited as the fundamental circumstances that gave way to the Arab Spring in 2011. This year the food price index is currently at 210 – a level believed to be the threshold beyond which civil unrest is probable. Further, the UN’s Food and Agriculture Organization is already reporting record high prices for dairy, meat, sugar and cereals and also warns – due to the reduced grain stocks from last year’s droughts – that prices can be expected to increase later this year as well. Another factor driving up the costs of food is the price of oil. Because the entire industrial agriculture process requires the use of fossil fuels, the high price of oil results in a corresponding rise in the price of food. The future of oil production and whether we have reached “peak oil” may still be a matter of contention for some, but the increasing reliance on extreme energy processes (tar sands, hydraulic fracturing, mountaintop removal, etc.) is a blatant indication that the days of cheap petroleum are over. This implies that costs for energy extraction, and therefore the price of oil and food, will only continue to rise dramatically in the foreseeable future. As the struggle for resources and security escalates, governments around the world will rely more heavily upon totalitarian forms of control and reinforcement of order, especially as civil unrest becomes more common and outside threats with other countries intensify. However, this is also likely to be matched by an increase in resistance to the demands of the socio-political-economic hierarchies. Emerging Alternatives As system disruptions continue to occur and food and other essential resources become scarcer, remaining populations will have to become locally self-sufficient to a degree not seen for several generations. The need for restructuring the way in which our communities have access to food and water is greater now than perhaps ever before – and there are more than a few examples being built around the world right now. A few weeks ago, I had the privilege of hearing a presentation at the Ecosocialist Conference in NYC on precisely these alternatives. Speaking on a panel entitled “Agriculture and Food: Sustainable or Profitable?” was David Barkin, a Distinguished Professor at the Universidad Autonoma Metropolitana in Mexico City, who has been collaborating with thousands of communities in Mexico and Latin America involved in constructing post-capitalist societies. [8] In his presentation he spoke greatly about local groups – comprising of 30,000-50,000 people each, together being more than 130 million people – throughout Mexico and Latin America that are rebuilding their societies based on five principles that were written by the communities themselves and then systematized. Self-management; through a process of participatory democracy Solidarity; through rejecting the notion of wage-labor and re-organizing the entire work process Self-sufficiency; which includes contacts and exchanges between many organizations so that you are not limited to the resource or climate-base of a single community but a development of trade networks Diversification Sustainable regional resource management; most communities in Mexico and Latin American define a region based on the natural definition of watersheds, although that may not be the most applicable natural definition in other parts of the world He also spoke of groups such as the EZLN as examples of groups building alternative models – not models that are working at a super-structural level to change government policy, but models that give power and control directly to the community for the purposes of self-sufficiency and sustainability. In Peru, Bolivia, and Ecuador there is a phrase “El Buen Vivir” or “Sumak Kawsay,” – a cosmology that is said to come from indigenous cultures – that is actually informing how communities are rebuilding. It is proposed to promote sustainable relationships with nature and for communities to be less consumerist. In addition to radically rebuilding our communities so that they exist not only wholly independent from industrial agriculture but also in harmony with the natural world, we need to build a greater resistance movement against industrial infrastructure that continues to threaten the very possibility of people all over the world from taking these steps. Mining and its infrastructure, which is required for the development of solar panels and wind turbines, uses gigantic volumes of water for it to work. Because of this, in many parts of Mexico (where North American mining companies currently have concessions on 40% of the country’s land area) and Latin America, mining is a question of taking water away from agriculture.

### 1AC- Solvency

#### Thus, the plan;

#### Resolved: Public Colleges and Universities of the United States of America ought not restrict constitutionally protected speech in the form of scientific research patents that limit public speech

#### Patents kill innovation and open scientific inquiry for the sake of profit—they should be prohibited

**Vedder 15**: Richard Vedder. See Thru Education. “Should Universities Own Patents” May 5th, 2015. <http://www.seethruedu.com/should-universities-own-patents//> RW

As an economic historian, I appreciate that America’s ascendancy to becoming the world’s premier economy resulted largely from innovation and technological progress, and that the high level of American invention and improvements reflected a high level of protection of intellectual property rights. Our patent system has appropriately incentivized invention and change. My university, Ohio University, has collected tens of millions of dollars in patent royalties, mostly related to a human growth hormone drug invented by a friend and colleague. A Center for College Affordability sidekick of mine (and former student), Jonathan Robe, is well on his way at Duke Law School to becoming a first-rate intellectual property rights attorney. Despite of all of that, however, I am uneasy about university efforts to commercialize on research (and the patents associated with that) on three grounds. First, universities are in the business of both creating and disseminating knowledge – sharing what they know with the rest of the world. Sometimes, universities, often in partnership with private companies, reach agreements to curtail the publication of research results in order to secure intellectual property rights claims through the patent process. The alleged positive spillover effects of universities largely derive from the spread of knowledge, and when that is curtailed in some fashion, those positive benefits are presumably suppressed. Second, universities live off public subsidies – even so called “private” universities that derive huge amounts in federal research grants. If the taxpayers are assisting in the funding of university research, how can they legitimately claim a private property right and exclude the general taxpaying public from the use of the outcomes? Legally, the Bayh-Dole Act of 1980 allowed for universities to own patents. Should we revisit that? Are there ways to disseminate commercially valuable research knowledge to allow entrepreneurs to provide new innovations without using the patent system? Third, commercialized research is a little bit like big-time collegiate football, or maybe oil prospecting. My reading of the evidence suggests few universities really get a big payoff in terms of commercial benefits. Just as fewer than 20 percent of big-time (Division 1) athletic programs break even, at least one study shows that the proportion of university tech licensing programs breaking even is about the same. Many universities build large bureaucracies for “tech support,” most of which on balance are a drain on institutional resources. In a recent Wall Street Journal op-ed, Brian Love raises another related point. One rap on the current patent system is that lots of lawsuits, some rather frivolous, are filed annually claiming patent infringement – and some of those are brought by universities trolling for settlements providing them with royalty income (whether the claims are valid or not). This raises the cost of innovation and protecting intellectual property rights. Moreover, although university presidents and university trade associations like the American Council on Education have fought patent reform legislation, according to Love rank-and-file university researchers mostly oppose universities receiving patents. There are, of course, arguments for universities joining the real world, and becoming involved in markets and entrepreneurial activity. Indeed, I have long championed the for-profit private universities as a viable alternative to traditional not-for-profit education. But traditional universities want to have it both ways: they want the tax subsidies and exemptions associated with their non-profit status, but they also want to claim they own private intellectual property and make millions from that as well. They want the gains from science research, but not face the risks that private firms like Pfizer or Google (who pay taxes to help fund the traditional universities) have when they spend on research and development. I don’t know whether the benefits of the proposed Innovation Act of 2015 (largely making it more costly for patent holders to claim patent infringement) exceed the costs. I do know, however, that universities are trying to have their cake and eat it too – to commingle public support of research with the receipt of money-generating private monopoly powers over intellectual property. My guess is this is more about rent-seeking than supporting research, and the universities would fight as fiercely as ever for university grants even if their ability to receive patents disappeared (which is not the case under the Innovation Act, which passed the House of Representatives in the last Congress).

#### Aff is T -Patents infringe on constitutionally protected speech- they violate scientific research and freedom

- “Public colleges and universities ought not restrict constitutionally protected speech. Currently, universities using patents hurts free speech access to the general public, that is a way they have restrictions on free speech now, the aff removes one of those restrictions, so it’s T. It’s also not effects T because the point of removing patents as described by our evidence is for speech to be free.

**Park 14** [Sandra Park,, February 27, 2014, "Is the "Patent Happy" Patent Office Violating the First Amendment?," American Civil Liberties Union, <https://www.aclu.org/blog/patent-happy-patent-office-violating-first-amendment>] NB

Last April, during the Supreme Court oral [arguments](http://www.oyez.org/cases/2010-2019/2012/2012_12_398) in [our case challenging patents on human genes](http://www.aclu.org/genepatents), Justice Kagan remarked, "The PTO seems very patent happy." Her comment, and the [unanimous decision](https://www.aclu.org/blog/womens-rights-free-speech-technology-and-liberty/victory-supreme-court-decides-our-genes-belong) invalidating gene patents, clearly expressed the court's concern that the Patent Office is overstepping its authority by approving patents that thwart, rather than foster, scientific inquiry and progress. The Supreme Court will soon re-visit whether the Patent Office has gone too far in granting exclusive rights to what should properly remain in the commons. In the next few months, it will rule in [Alice Corp. Pty. Ltd. v. CLS Bank International](http://www.scotusblog.com/case-files/cases/alice-corporation-pty-ltd-v-cls-bank-international/), a software patent case that completely divided the U.S. Court of Appeals for the Federal Circuit and is sparking [controversy](http://www.washingtonpost.com/blogs/the-switch/wp/2014/02/26/will-the-supreme-court-save-us-from-software-patents/) in the tech world. Alice follows three recent [decisions](https://www.aclu.org/blog/womens-rights/when-patents-dont-equal-progress) – with the gene patents case being the last – issued by the court reaffirming the longstanding principle that the Patent Act does not permit patents on products of nature, laws of nature, and abstract ideas. Patents on abstract ideas are especially likely to raise First Amendment problems, as the First Amendment protects freedom of speech and thought. The case involves patents on a method for addressing the risk that one party might back out of a deal after the other one has already paid. You can read about the details of the patents [here](https://www.aclu.org/technology-and-liberty/alice-corporation-pty-ltd-v-cls-bank-international-amicus-brief), but the steps of Alice's patented method essentially call for a third party to keep track of financial transactions between two parties and then to instruct another institution to adjust the two parties' accounts accordingly at the end of the day. It's simple enough to imagine carrying out this process using pencil and paper to add up the transactions and a phone to communicate the account adjustment, but Alice's patents claim any computer implementation of this process. That means Alice has a monopoly on any software or hardware that performs this way of using a third party to address settlement risk, even when Alice has not created the programming code or designed the computer that has this capability. The district court invalidated Alice's patents under Section 101 of the Patent Act, concluding that Alice is seeking to patent the abstract idea of escrow. The court found that using a third party to guarantee a transaction is a basic business concept that cannot be monopolized. The fact that this was done through a computer did not give rise to an invention, because Alice did not want to patent specific software program or hardware, but any and all software and hardware that could execute the method. When the case reached the Federal Circuit, the ten judges were split, issuing six separate opinions. The rift within the Federal Circuit is deeply problematic, as the court decides all patent appeals from across the country. Continued confusion at the Federal Circuit about whether an abstract idea can be patented will result in a plethora of patents that impede companies, researchers, and others from using fundamental intellectual concepts to create new products and services. Today, the ACLU filed an [amicus brief](https://www.aclu.org/technology-and-liberty/alice-corporation-pty-ltd-v-cls-bank-international-amicus-brief) in Alice Corp. arguing that the prohibition on patenting abstract ideas must be enforced, because it is compelled by the Constitution. The Patent Office and courts generally have not addressed the effect of the Constitution on patent regulation. But the government's authority to issue patents, like all government action, is subject to constitutional limits. Copyright law has integrated First Amendment protections in several ways – for example, by distinguishing between ideas and expression. Disallowing patents on abstract ideas plays the same role, by protecting freedom of thought as guaranteed under the First Amendment. Because Alice's patents claim an abstract intellectual concept, they constrain and control how others can think about and build on that concept – including those developing new software

# 1AR- Substance

**AT Disease Defense**

**Extinction- burnout wrong**

Karl-Heinz **Kerscher 14**, Professor, “Space Education”, Wissenschaftliche Studie, 2014, 92 Seiten

The death toll for a pandemic is equal to the virulence, the deadliness of the pathogen or pathogens, multiplied by the number of people eventually infected. It has been hypothesized that there is an upper limit to the virulence of naturally evolved pathogens. This is because a pathogen that quickly kills its hosts might not have enough time to spread to new ones, while one that kills its hosts more slowly or not at all will allow carriers more time to spread the infection, and thus likely out-compete a more lethal species or strain. This simple model predicts that if virulence and transmission are not linked in any way, pathogens will evolve towards low virulence and rapid transmission. However, this assumption is not always valid and in more complex models, where the level of virulence and the rate of transmission are related, high levels of virulence can evolve. The level of virulence that is possible is instead limited by the existence of complex populations of hosts, with different susceptibilities to infection, or by some hosts being geographically isolated. The size of the host population and competition between different strains of pathogens can also alter virulence. There are numerous historical examples of pandemics that have had a devastating effect on a large number of people, which makes the possibility of global pandemic a **realistic threat to human civilization.**

**We cognitively underestimate disease**

Patrick S. **Roberts 8**, fellow with the Program on Constitutional Government at Harvard and assistant professor with the Center for Public Administration and Policy at Virginia Tech, January, Review of Richard Posner’s “Catastrophe: Risk and Response,” *Homeland Security Affairs*, Volume 4, No. 1

Most people have difficulty thinking about abstract probabilities as opposed to events they have observed. Human mental capacity is limited, and startling events such as the attacks of September 11 trigger our attention. But evaluating risk requires paying attention to what we do not see. There has been surprisingly little attention in the popular media given to pandemic flu, even though influenza killed approximately twenty million people in 1918-1919. The disease has no cure, and vaccines are difficult to produce because of the mutability of the virus. People from all walks of life pay greater attention to issues in recent memory and tend to give greater weight to confirmatory evidence; the cumulative effect is to under- prepare for catastrophe.

**Disease definitely causes extinction**

**Greger 8** – M.D., is Director of Public Health and Animal Agriculture at The Humane Society of the United States (Michael Greger, , Bird Flu: A Virus of Our Own Hatching, <http://birdflubook.com/a.php?id=111>)

Senate Majority Leader Frist describes the recent slew of emerging diseases in almost biblical terms: “All of these [new diseases] were advance patrols of a great army that is preparing way out of sight.”3146 Scientists like Joshua Lederberg don’t think this is mere rhetoric. He should know. Lederberg won the Nobel Prize in medicine at age 33 for his discoveries in bacterial evolution. Lederberg went on to become president of Rockefeller University. “Some people think I am being hysterical,” he said, referring to pandemic influenza, “but there are catastrophes ahead. We live in evolutionary competition with microbes—bacteria and viruses. There is no guarantee that we will be the survivors.”3147 There is a concept in host-parasite evolutionary dynamics called the Red Queen hypothesis, which attempts to describe the unremitting struggle between immune systems and the pathogens against which they fight, each constantly evolving to try to outsmart the other.3148 The name is taken from Lewis Carroll’s Through the Looking Glass in which the Red Queen instructs Alice, “Now, here, you see, it takes all the running you can do to keep in the same place.”3149 Because the pathogens keep evolving, our immune systems have to keep adapting as well just to keep up. According to the theory, animals who “stop running” go extinct. So far our immune systems have largely retained the upper hand, but the fear is that given the current rate of disease emergence, the **human race is losing the race**.3150 In a Scientific American article titled, “Will We Survive?,” one of the world’s leading immunologists writes: Has the immune system, then, reached its apogee after the few hundred million years it had taken to develop? Can it respond in time to the new evolutionary challenges? These perfectly proper questions lack sure answers because we are in an utterly unprecedented situation [given the number of newly emerging infections].3151 The research team who wrote Beasts of the Earth conclude, “Considering that bacteria, viruses, and protozoa had a more than two-billion-year head start in this war, a victory by recently arrived Homo sapiens would be remarkable.”3152 Lederberg ardently believes that emerging viruses may imperil human society itself. Says NIH medical epidemiologist David Morens, When you look at the relationship between bugs and humans, the more important thing to look at is the bug. When an enterovirus like polio goes through the human gastrointestinal tract in three days, its genome mutates about two percent. That level of mutation—two percent of the genome—has taken the human species eight million years to accomplish. So who’s going to adapt to whom? Pitted against that kind of competition, Lederberg concludes that the human evolutionary capacity to keep up “may be dismissed as almost totally inconsequential.”3153 To help prevent the evolution of viruses as threatening as H5N1, the least we can do is take away a few billion feathered test tubes in which viruses can experiment, a few billion fewer spins at pandemic roulette. The human species has existed in something like our present form for approximately 200,000 years. “Such a long run should itself give us confidence that our species will continue to survive, at least insofar as the microbial world is concerned. Yet such optimism,” wrote the Ehrlich prize-winning former chair of zoology at the University College of London, “might easily transmute into a tune whistled whilst passing a graveyard.”3154

**AT Posner 5**

**Posner goes aff**

**Posner, 5**-- University of Chicago Law School senior lecturer

[Richard A., United States Court of Appeals Seventh Circuit Judge, "Catastrophe: the dozen most significant catastrophic risks and what we can do about them.(Excerpt)(Cover Story)," www.highbeam.com/doc/1G1-130930466.html,]

The 1918-1919 flu pandemic is a reminder that nature may yet do us in. The disease agent was an unexpectedly lethal variant of the commonplace flu virus. Despite its lethality, it spread far and wide because most of its victims did not immediately fall seriously ill and die, so they were not isolated from the healthy population but instead circulated among the healthy, spreading the disease. (1) No one knows why the 1918-1919 pandemic was so lethal, although it may have been due to a combination of certain features of the virus's structure with the crowding of troops in the trenches and hospitals on the Western Front (where the pandemic appears to have originated near the end of World War D, facilitating the spread of the disease. (2) The possibility cannot be excluded that an even more lethal flu virus than that of the 1918-1919 pandemic will appear someday and kill many more people. There is still no cure for flu, and vaccines may be ineffective against a new mutant strain--and the flu virus is notable for its high rate of mutations. (3) Another great twentieth-century pandemic, AIDS, which has already killed more than 20 million people, (4) illustrates the importance to the spread of a disease of the length of the infectious incubation period. The longer a person is infected and infectious---yet either asymptomatic or insufficiently ill to be isolated from the healthy population--the farther the disease will spread before effective measures, such as quarantining, are taken. What has proved to be especially pernicious about AIDS is that its existence was not discovered until millions of people had been infected by and were transmitting the MDS virus (HIV), which has an average infectious incubation period of 10 years. Given the length of that period, the only thing that may have prevented MDS from wiping out the human race is that it is not highly infectious, as it would be if HIV were airborne rather than being transmissible only by being introduced into a victim's bloodstream. Even by unsafe sex it is "generally poorly transmitted. For example, the probability of transmission from a single anal receptive sexual contact with an infected partner is estimated at 1 in 100 to 1 in 500." (5) However, the length of HIV's infectious incubation period and the difficulty of transmission may be related; for, given that difficulty, were the virus unable to "hide" from its host's immune system for a considerable time, it would be detected and destroyed before it had a chance to replicate itself in another host. (6) AIDS illustrates the further point that despite the progress made by modern medicine in the diagnosis and treatment of diseases, developing a vaccine or cure for a new (or newly recognized or newly virulent) disease may be difficult, protracted, even impossible. Progress has been made in treating AIDS, but neither a cure nor a vaccine has yet been developed. And because the virus's mutation rate is high, the treatments may not work in the long run. (7) Rapidly mutating viruses are difficult to vaccinate against, which is why there is no vaccine for the common cold and why flu vaccines provide only limited protection. (8) Paradoxically, a treatment that is neither cure nor vaccine, but merely reduces the severity of a disease, may accelerate its spread by reducing the benefit from avoiding becoming infected. This is an important consideration with respect to AIDS, which is spread mainly by voluntary intimate contact with infected people. Yet the fact that Homo sapiens has managed to survive every disease to assail it in the 200,000 years or so of its existence is a source of genuine comfort, at least if the focus is on extinction events. There have been enormously destructive plagues, such as the Black Death, smallpox, and now AIDS, but none has come close to destroying the entire human race. There is a biological reason. Natural selection favors germs of limited lethality; they are fitter in an evolutionary sense because their genes are more likely to be spread if the germs do not kill their hosts too quickly. The AIDS virus is an example of a lethal virus, wholly natural, that by lying dormant yet infectious in its host for years maximizes its spread. Yet there is no danger that AIDS will destroy the entire human race. The likelihood of a natural pandemic that would cause the extinction of the human race is probably even less today than in the past (except in prehistoric times, when people lived in small, scattered bands, which would have limited the spread of disease), despite wider human contacts that make it more difficult to localize an infectious disease. The reason is improvements in medical science. But **the comfort is a small one.** Pandemics can still impose enormous losses and resist prevention and cure: the lesson of the AIDS pandemic. And **there is always a [first] time.** That the human race has not yet been destroyed by germs created or **made more lethal by modern science**, as distinct from completely natural disease agents such as the flu and AIDS viruses, is even less reassuring. **We haven't had these products long enough to be able to infer survivability from our experience with them**. A recent study suggests that as immunity to smallpox declines because people am no longer being vaccinated against it, monkeypox may evolve into "a successful human pathogen," (9) yet one that vaccination against smallpox would provide at least some protection against; and even before the discovery of the smallpox vaccine, smallpox did not wipe out the human race. What is new is the possibility that science, bypassing evolution, will enable monkeypox to be "juiced up" through gene splicing into a far more lethal pathogen than smallpox ever was.

**Patents Bad**

**Patents collapse generic entry – advertisement, presentations, and pricing – we have the best data**

**Ellison & Ellison 11** (G. Ellison: Department of Economics, Massachusetts Institute of Technology S. F. Ellison: Department of Economics, Massachusetts Institute of Technology, “Strategic Entry Deterrence and the Behavior of Pharmaceutical Incumbents Prior to Patent Expiration”, American Economic Journal: Microeconomics 3 (February 2011): 1–36 http://www.aeaweb.org/articles.php?doi=10.1257/mic.3.1.1)

IV. The Pharmaceutical Industry

In this section, we provide some background on the US pharmaceutical industry, discuss strategic instruments that firms might try to use **to deter generic entry,** describe our dataset, and note that the dataset has the type of heterogeneity in market size required for our approach.

A. Industry Background

Prior to 1984, all but the most popular drugs tended to retain their monopoly position in the US market long after their patent protection expired. FDA regulations required any firm wanting to produce a generic substitute to repeat the lengthy process of tests and clinical trials to which the incumbent had been subjected. Things changed dramatically in the mid-1980s: the Waxman-Hatch Act of 1984 reduced regulatory barriers to generic entry, and state laws mandating/allowing generic substitution by pharmacists boosted the market share of generic drugs.11

When a blockbuster drug like Prozac loses patent protection, generic entry is swift and sure—within 18 months, Prozac faced 21 generic competitors and had lost more than 80 percent of its market. Most drugs, however, **are not blockbusters**. Many FDA-approved drugs never achieve much commercial success. Others have been largely supplanted by the time they lose protection. For such drugs, **generic entry is much less certain.**

There are a number of investments that one could imagine pharmaceutical incumbents **distorting in order to deter entry**. The most obvious is **advertising**, which plays an important role in pharmaceutical markets—an oft-cited statistic by critics of the pharmaceutical industry is that more money is spent by the industry on marketing than on research and development. In the period we study, there were two main advertising channels: “detail” and “journal” advertising.12 Detail advertising is the practice of having sales representatives visit doctors’ offices to inform them about studies assessing a drug’s effectiveness and otherwise promote the product in one-on-one conversations. Journal advertising is the placement of advertisements in medical journals and other publications read by doctors. Expenditures on detail advertising are typically much larger than expenditures on journal advertising.

A second potential instrument for strategic entry deterrence that has received much less attention is presentation proliferation. Many prescription drugs are sold in a large number of “presentations.” The tranquilizer Haldol, for example, is sold in 1/2 , 1, 2, 5, 10, and 20 milligram tablets, as a concentrated liquid in bottles, and as a solution for intravenous use in vials, ampules, and disposable syringes. When a drug is produced in many presentations, it would be more costly for an entrant to replicate the incumbent’s full product line. A potential entrant can (and often does) choose to produce a strict subset of the set of presentations offered by the incumbent.

This does, however, reduce subsequent profits. Rules on generic substitution vary from state to state, but they typically make it difficult for patients to substitute across presentations. For example, if a doctor has prescribed that a patient take one 100mg tablet per day, then the pharmacist may be prevented from dispensing 50mg tablets and instructing the consumer to take two tablets per day.

**An additional instrument that firms might use to deter entry is pricing**. Pharmaceutical manufacturers sell drugs to different consumers at different prices. Our data contain average wholesale prices for two classes of purchasers: hospitals and drugstores.13

B. Data

Our basic dataset includes 63 distinct chemical compounds, sold under 71 different brand names, that faced potential generic entry as the result of a patent or FDA exclusivity expiration between 1986 and 1992. Details of the construction of our dataset appear in Appendix Section C.

The main variables used in the analysis are described in Tables 1 and 2. The first five variables in Table 2 are defined at the drug level. The mean of the Entry3Yr variable reflects that 37 of the 63 drugs experienced generic entry in the three-year window. The mean of the Revenue3 variable indicates that the average drug had annual revenues of $39.4 million.

Detail3 and Journal3 are average annual values of the advertising variables over the same three-year, pre-expiration period for which Revenue3 was computed. The values for the mean advertising ratios in Table 2 indicate that 1.4 percent of sales were spent on journal advertising and approximately 5 percent on detail advertising. 14 PresHerf 3 is a Herfindahl-style measure of the degree to which revenues are concentrated in a small number of presentations in the three years prior to patent expiration.15 Although the average number of presentations per drug is greater thansix, the mean value of 0.54 indicates that one or two presentations usually account for a large portion of revenues.16 The Detail3, Journal3, and PresHerf 3 variables have 69 or 70 observations rather than 63 because we have defined them at the level of the brand name rather than at the level of the drug.17 The DPric e t and HPric e t variables are yearly observations of the price of one presentation of each drug deflated by the Consumer Price Index. The summary statistics indicate that the average price increases in the drugstore and hospital markets are 1.9 percent and 1 percent above the rate of inflation.

The data on the HospFrac variable reflect that drugstore revenues are usually substantially larger than hospital revenues.

**Err aff– empirics are on our side – free market solves best.**

--increased innovation in the absence of patents, Switzerland and Italy until the late 1970s were able to make more developments

--innovation comes from learning and dynamic adjustment to prices that come from development of new medicines, monopoly power dissuades from that

--incentives come from social surplus.

**Hashemi 12** (Fariba Hashemi Swiss Federal Institute of Technology, Lausanne, Switzerland “Industry Dynamics in Pharmaceuticals”, Pharmacology & Pharmacy, 2012, 3, 1-6 http://dx.doi.org/10.4236/pp.2012.31001 Published Online January 2012 (http://www.SciRP.org/journal/pp))

As early as in the early seventies, Jack Hirshleifer [22] illustrated that economically valuable information can be traded **in the absence of patents** and under condition of competition. More recently, Boldrin and Levine [1] use historical evidence to illustrate that intellectual property protection in Pharmaceuticals has **varied enormously** over time and space, and that the **modern Pharmaceutical industry developed faster in those countries where pat-ents were fewer and weaker,** example Switzerland and Italy until late 1970s (see “World’s Shortest History of Pharmaceutical Patents” in Boldrin and Levine 2008, Chapter 9). Boldrin and Levine [23-26] have forcefully argued that there is no theoretical need to postulate either increasing returns or monopoly power to understand the dynamics of innovation in Pharmaceuticals, and that the **traditional competitive model provides a more solid foundation** for the examination of R & D processes in this industry. R & D is the life blood of the Pharmaceu-tical industry. The industry’s best hope **lies in innova-tion**—its traditional strength. Boldrin and Levine argue that learning and dynamic adjustment to equilibrium are **weakened by obstacles such as patents**, which suppress the sharing of ideas and limit the availability of material for imitation and trial-and-error. It would be worthwhile to incorporate the impact of competition and intellectual property policies on the evolution of Pharmaceutical in-dustry. Different market structures determine different allocations of the social surplus of innovation among inventors, imitators and consumers, and hence, provide different incentives to innovate. A good understanding of which kinds of characteristics lead to which kinds of dy-namics helps us better understand how incentives should be provided for the socially optimal amount of creative activity to take

**Food Impact**

**Food insecurity causes extinction**

**Trudell 5**

Robert H., Fall, Trudell,  J.D. Candidate 2006, Food Security Emergencies And The Power Of Eminent Domain: A Domestic Legal Tool To Treat A Global Problem, 33 Syracuse J. Int'l L. & Com. 277, Lexis

2. But, Is It Really an Emergency?  In his study on environmental change and security, J.R. McNeill dismisses the scenario where environmental degradation destabilizes an area so much that "security problems and ... resource scarcity may lead to war." 101 McNeill finds such a proposition to be a weak one, largely because history has shown society is always able to stay ahead of widespread calamity due, in part, to the slow pace of any major environmental change. 102 This may be so. However, as the events in Rwanda illustrated, the environment can breakdown quite rapidly - almost before one's eyes - when food insecurity drives people to overextend their cropland and to use outmoded agricultural practices. 103 Furthermore, as Andre and Platteau documented in their study of Rwandan society, overpopulation and land scarcity can contribute to a breakdown of society itself. 104  Mr. McNeill's assertion closely resembles those of many critics of Malthus. 105 The general argument is: whatever issue we face (e.g., environmental change or overpopulation), it will be introduced at such a pace that we can face the problem long before any calamity sets in. 106  This wait-and-see view relies on many factors, not least of which are a functioning society and innovations in agricultural productivity. But, today, with up to 300,000 child soldiers fighting in conflicts or wars, and perpetrating terrorist acts, **the very fabric** of society is under increasing world-wide pressure. 107 Genocide, anarchy, dictatorships, and war are endemic throughout Africa; it is a troubled continent whose problems threaten global security and challenge **all of humanity**. 108 As  [\*292]  Juan Somavia, secretary general of the World Social Summit, said: "We've replaced the threat of the nuclear bomb with the threat of a social bomb." 109 Food insecurity is part of the fuse burning to set that bomb off. It is an emergency and we must put that fuse out before it is too late.

**Causes war and instability**

**Hendrix 16**

Dr. Cullen Hendrix (Associate Professor at the Sié ChéouKang Center for International Security and Diplomacy at the Korbel School at the University of Denver; Nonresident Senior Fellow at the Peterson Institute for International Economics in Washington, DC; and Senior Research Advisor at the Center for Climate & Security, also in Washington, DC). “When Hunger Strikes: How Food Security Abroad Matters for National Security at Home.” The Chicago Council on Global Affairs. April 2016. https://www.thechicagocouncil.org/sites/default/files/Report\_When\_Hunger\_Strikes\_1604.pdf

More than half of the world’s poorest people work as farmers in low-income countries, and growing their incomes and yields is twice as effective at reducing poverty as investment in other sectors.6 US investments in agricultural research and development programs such as Feed the Future, a US program to advance food security overseas, have begun to see strong gains in agricultural productivity and reductions in rates of child undernutrition, among other crucial outcomes.7 However, with a **burgeoning global population** expected to surpass 9 billion by 2050, an **increasingly volatile climate**, and **rapid urbanization**, the task of ensuring that our food system is abundant, nutritious, and stable has never been more important. This brief explores one potent outcome of the consequences of high food prices and food insecurity: political instability. Alongside the recommendations suggested, broader development initiatives are central to mitigating protracted and pervasive global food insecurity. **High food prices exacerbate food insecurity, leading to political instability** Recent events demonstrate how high the stakes remain. Following a 20-year period of relative stability in world food markets, extreme price volatility marked the 2000s, particularly the period from 2007 to the present (see Figure 1, “Food prices and food-related protests, 1990–2015”). From 2007 to 2011, high food prices swelled the ranks of the world’s food insecure, with women and children most acutely affected. Since then, the number of food-insecure people has trended downward—thanks in large part to lower prices and increased agriculture investment by governments, the private sector, and nonprofits. However, we can ill afford to be complacent about prospects going forward, as food insecurity is expected to deepen in key regions if the current trajectory holds. The social and economic costs of these food price spikes were considerable, however the political fallout—as well as the relationship between food and political stability it highlights—was just as damaging. Food price–related protests, also in Figure 1, toppled governments in Haiti and Madagascar in 2007–08. And in 2010–11, food prices and food insecurity were again implicated in the political turmoil and mass uprisings of the Arab Spring. These movements did not all begin violently, but once protesters were mobilized, heavy-handed government responses often led otherwise peaceful protests to become violent and destabilizing. In both periods, countries of high strategic significance to the United States were affected (see Figure 2, “Food riots 2007–11 and current oil exports”). The unrest in the Middle East and North Africa roiled energy markets: more than 20 percent of world crude and petroleum exports pass through either the Suez Canal or the Strait of Hormuz, and both were ringed by countries experiencing unrest.9 Though oil flows through those channels were not disrupted, unrest in Libya and concern that the Arab Spring would spread to major Gulf oil exporters (Kuwait, Saudi Arabia, and the United Arab Emirates) pushed already high oil prices up by 15 percent in late February and early March 2011.10 The resulting instability strained Egyptian relations with Israel and necessitated a NATO intervention in Libya. The ongoing civil war in Syria—which can be linked to drought, food insecurity, rapid urbanization, and exclusionary rule (see Box 1, “Important terms”)—is **exacting a massive toll** and contributing to growing tensions with Russia, dissention over refugee resettlement among NATO partners in Europe, and the escalation of a serious threat to the Iraqi government. Closer to US borders, soaring prices for staples like rice and beans in Haiti led to a week of rioting in 2008 during which five people were killed, with the violence involving both Haitian police and UN Peacekeepers. Moreover, rising food prices and deteriorating economic prospects there fueled attempts to immigrate to the United States. As food prices shot up almost 20 percent in 2007, US Coast Guard interdictions of Haitians rose 34 percent, straining US Coast Guard resources.11 Thus the food riots of 2007–11 offer very clear examples of how food insecurity and grievances over high prices abroad affect US national security at home and stress national security resources.

**GM Crops Good**

**GM crops are key to stabilizing and increasing food supplies—that solves food price spikes**

**Qaim and Kouser 13**

Matin Qaim (Department of Agricultural Economics and Rural Development, Georg-August-University of Goettingen, Goettingen, Germany) and Shahzad Kouser (Institute of Agricultural and Resource Economics, University of Agriculture, Faisalabad, Pakistan). “Genetically Modified Crops and Food Security.” PLoS One. 2013. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3674000/

There are three possible pathways how GM crops could impact food security. First, GM crops could contribute to food production increases and thus improve the availability of food at global and local levels. Second, GM crops could affect food safety and food quality. Third, GM crops could influence the economic and social situation of farmers, thus improving or worsening their economic access to food. This latter aspect is of particular importance given that an estimated 50% of all undernourished people worldwide are small-scale farmers in developing countries [7]. In regard to the first pathway, GM technologies could make food crops higher yielding and more robust to biotic and abiotic stresses [8], [9]. This could **stabilize and increase food supplies**, which is important against the background of **increasing food demand**, **climate change**, and land and **water scarcity.** In 2012, 170 million hectares (ha) – around 12% of the global arable land – were planted with GM crops, such as soybean, corn, cotton, and canola [10], but most of these crops were not grown primarily for direct food use. While **agricultural commodity prices would be higher** without the productivity gains from GM technology [11], impacts on food availability could be bigger **if more GM food crops were commercialized**. Lack of public acceptance is one of the main reasons why this has not yet happened more widely [12]. Concerning the second pathway, crops with new traits can be associated with food safety risks, which have to be assessed and managed case by case. But such risks are not specific to GM crops. **Long-term research** confirms that GM technology is not per se more risky than conventional plant breeding technologies [13]. On the other hand, GM technology can help to breed food crops with higher contents of micronutrients; a case in point is Golden Rice with provitamin A in the grain [14]. Such GM crops have not yet been commercialized. Projections show that they could reduce nutritional deficiencies among the poor, entailing sizeable positive health effects [15], [16]. The third pathway relates to GM crop use by smallholder farmers in developing countries. Half of the global GM crop area is located in developing countries, but much of this refers to large farms in countries of South America. One notable exception is Bacillus thuringiensis (Bt) cotton, which is grown by around 15 million smallholders in India, China, Pakistan, and a few other developing countries [10]. Bt cotton provides resistance to important insect pests, especially cotton bollworms. Several studies have shown that Bt cotton adoption reduces chemical pesticide use and increases yields in farmers’ fields [17]–[20]. There are also a few studies that have shown that these benefits are associated with increases in farm household income and living standard [21]–[23]. Higher incomes are generally expected to cause increases in food consumption in poor farm households. On the other hand, cotton is a non-food cash crop, so that the nutrition impact is uncertain. Here we address this question and analyze the impact of Bt cotton adoption on calorie consumption and dietary quality in India. Bt cotton was first commercialized in India in 2002. In 2012, over 7 million farmers had adopted this technology on 10.8 million ha – equivalent to 93% of the country’s total cotton area [10]. For the analysis, we carried out a household survey and collected comprehensive data over a period of several years. This is the first ex post study that analyzes food security effects of Bt cotton or any other GM crop with micro level data.

**GM crops solve extinction**

**Trewavas 2k**

Anthony, Institute of Cell and Molecular Biology – University of Edinburgh, “GM Is the Best Option We Have”, AgBioWorld, 6-5, <http://www.agbioworld.org/biotech-info/articles/biotech-art/best_option.html>

There are some Western critics who oppose any solution to world problems involving technological progress. They denigrate this remarkable achievement. These luddite individuals found in some Aid organisations instead attempt to impose their primitivist western views on those countries where blindness and child death are common. This new form of Western cultural domination or neo-colonialism, because such it is, should be repelled by all those of good will. Those who stand to benefit in the third world will then be enabled to make their own choice freely about what they want for their own children. But these are foreign examples; global warming is the problem that requires the UK to develop GM technology. 1998 was the warmest year in the last one thousand years. Many think global warming will simply lead to a wetter climate and be benign. I do not. Excess rainfall in northern seas has been predicted to halt the Gulf Stream. In this situation, average UK temperatures would fall by 5 degrees centigrade and give us Moscow-like winters. There are already worrying signs of salinity changes in the deep oceans. Agriculture would be seriously damaged and necessitate the rapid development of new crop varieties to secure our food supply. We would not have much warning. Recent detailed analyses of arctic ice cores has shown that the climate can switch between stable states in fractions of a decade. Even if the climate is only wetter and warmer new crop pests and rampant disease will be the consequence. GM technology can enable new crops to be constructed in months and to be in the fields within a few years. This is the unique benefit GM offers. The UK populace needs to much more positive about GM or we may pay a very heavy price. In 535A.D. a volcano near the present Krakatoa exploded with the force of 200 million Hiroshima A bombs. The dense cloud of dust so reduced the intensity of the sun that for at least two years thereafter, summer turned to winter and crops here and elsewhere in the Northern hemisphere failed completely. The population survived by hunting a rapidly vanishing population of edible animals. The after-effects continued for a decade and human history was changed irreversibly. But the planet recovered. Such examples of benign nature's wisdom, in full flood as it were, dwarf and make miniscule the tiny modifications we make upon our environment. There are apparently 100 such volcanoes round the world that could **at any time** unleash forces as great. And even smaller volcanic explosions change our climate and can easily threaten the security of our food supply. **Our hold on this planet is tenuous.** In the present day an equivalent 535A.D. explosion would destroy much of our civilisation. **Only those with agricultural technology sufficiently advanced would have a chance at survival.** **Colliding asteroids** are another problem that requires us to be forward-looking accepting that technological advance may be the only buffer between us and annihilation.

**Pharma Good—Short**

**Pharma profits are key to innovation—that solves diseases which cause extinction**

**Engelhardt 8**

PhD, MD, Professor of Philosophy @ Rice (Hugo, “Innovation and the Pharmaceutical Industry: Critical Reflections on the Virtues of Profit,” EBrary)

Many are suspicious of, or indeed jealous of, the good fortune of others. Even when profit is gained in the market without fraud and with the consent of all buying and selling goods and services, there is a sense on the part of some that something is wrong if considerable profit is secured. There is even a sense that good fortune in the market, especially if it is very good fortune, is unfair. One might think of such rhetorically disparaging terms as "wind-fall profits". There is also a suspicion of the pursuit of profit because it is often embraced not just because of the material benefits it sought, but because of the hierarchical satisfaction of being more affluent than others. The pursuit of profit in the pharmaceutical and medical-device industries is tor many in particular morally dubious because it is acquired from those who have the bad fortune to be diseased or disabled. Although the suspicion of profit is not well-founded, this suspicion is a major moral and public-policy challenge. Profit in the market for the pharmaceutical and medical-device industries is to be celebrated. This is the case, in that if one is of the view (1) that the presence of additional resources for research and development **spurs innovation** in the development of pharmaceuticals and med-ical devices (i.e., if one is of the view that the allure of profit is one of the most effective ways not only to acquire resources but productively to direct human energies in their use), (2) that given the limits of altruism and of the willingness of persons to be taxed, the possibility of profits is necessary to secure such resources, (3) that the allure of profits also tends to enhance the creative use of available resources in the pursuit of phar-maceutical and medical-device innovation, and (4) if one judges it to be the case that such innovation is both **necessary to maintain the human species** in an ever-changing and always dangerous environment in which new microbial and other threats may **at any time** emerge to threaten human well-being, if not survival (i.e., that such innovation is necessary to prevent increases in **morbidity and mortality risks**), as well as (5) in order generally to decrease morbidity and mortality risks in the future, it then follows (6) that one should be concerned regarding any policies that decrease the amount of resources and energies available to encourage such innovation. One should indeed be of the view that the possibilities for profit, all things being equal, should be highest in the pharmaceutical and medical-device industries. Yet, there is a suspicion regarding the pursuit of profit in medicine and especially in the pharmaceutical and medical-device industries.

# 1AR- T

## New Affs

### 1AR – A2 New Affs Bad

#### Counter-interpretation: The aff may refuse to tell their opponent the plan text pre-round if the plan has never been broken before

#### Argument innovation – New affs give a strategic advantage since the neg can't prep beforehand – disclosure neutralizes the benefit to breaking. That outweighs:

#### A small prep advantage is good since it equalizes neg flex and time skew

#### Incentivizes new affs – otherwise this topic is too small and becomes repetitive, killing education after a few tournaments

#### Everyone cuts case negs to the common affs for TOC – new affs are key to avoid being prepped-out which the aff can’t recover from

#### It’s the TOC – it’s a reasonable neg burden to predict possible new affs after 5 months on a tiny topic.

#### Resource differential – big teams can always prep out smaller schools before the round if they're given the plan text

#### Strategic thinking – forces negs to think on their feet which boosts critical thinking and quick information processing rather than regurgitating coach-designed strategies. Their generics will still apply which solves clash – new affs just force debaters, not coaches, to do the thinking in round.

#### New Affs are inevitable- people have to disclose and debate them no matter what

### A2 Engagement

#### Off engagement/predictability –

#### Non-unique: All of your generics should apply anyways. If not, then that's a problem with the plan itself, not the fact that it's new

#### Non-unique: A half-hour before the round isn't enough time to cut prep that actually engages – all it means is they'll write some strategy out to same themselves prep time – means that the debate is harder for the aff but no more educational

#### Under their interp, affs will just write new advantages instead of new plans – that's net worse since generic counterplans check new advocacies but there's no good answer to new advantages.

## T Research

### CounterInterp

#### 1. Cross apply Park 14- that justifies that patents are not constitutionally protected speech because they abridge scientific freedom

#### 2. Counterinterp: 1st amendment protects scientific research- court precedent proves

#### Rabb 08

[Katherine A. Rabb (Director of The Knowledge Project: Censorship & Science, National Coalition Against Censorship), 2008, “CENSORING SCIENCE: A Stem Cell Story,” NCAC]//Lex-VR

According to philosopher Alexander Meikeljohn, the First Amendment at its core protects a free exchange of ideas specifically to allow for self governance.2 The right to receive information is critical to society’s ability to make informed decisions. Meikeljohn wrote that scientific knowledge is one of the most crucial areas of thought from which voters derive “the capacity for sane and objective judgment.” Specifically, he stated that “[t]he achievements of philosophy and the sciences in creating knowledge and understanding of men and their world must be made available, without abridgement, to every citizen.”3 In essence, the First Amendment, in order to function as intended in a democracy, must protect a right to receive information, a right to know. The Supreme Court has recognized this First Amendment right to know. As the Court found in Board of Education v. Pico, “the right to receive ideas is a necessary predicate of the recipient’s meaningful exercise of his own rights of speech, press and political freedom.”4 Justice Brennan’s plurality opinion for the Court in Pico said: Our precedents have focused “not only on the role of the First Amendment in fostering individual self-expression but also on its role in affording the public access to discussion, debate, and the dissemination of information and ideas.” And we have recognized that “the State may not, consistently with the spirit of the First Amendment, contract the spectrum of available knowledge.” In keeping with this principle, we have held that in a variety of contexts “the Constitution protects the right to receive information and ideas.” (Internal citation omitted)5Constitutionally protected free inquiry and expression in the fields of health and science currently are being abridged openly by the federal and some state governments. Those governments are obstructing scientific discovery by limiting the scope and type of certain research, and by impeding access to information about scientific developments. By disrupting the creation of new scientific information, those governments endanger the marketplace of ideas, threatening not only constitutional rights to freedom of speech, thought and inquiry, but alsosociety’s decision and policy-making processes that depend on reliable, valid information. There surely are special and rare

#### Net Benefits:

#### 1. Aff Variability- we are forced to defend a small subset of lit, screws strategic flex cuz whole rez affs get spread out to hyperspecific 1NCs and long 2NRs. Compensates abuse on limits—also compensates for abuse on limits.

#### 3. They Overlimit- this topic is incredibly small, a harm magnified by five months of debating prior to TOC. Expanding aff ground to research plans is necessary to prevent stale and repetitive debates that rehash the speech codes good/bad rounds or endowments DA. Two impacts: A. Depth- we have new innovative debates on different advantages in specific scenarios. Depth outweighs: switch side, other rounds, and research solve breadth. B. Fairness- 2Ns are prepared on different generic 1ARs.

### SL [:10]

#### Evaluate Strength of link- more offense to ed o/w marginal offense to fairness

#### A. Consistent with long terms goal of debate- education is portable

#### B. Need to prove 100% inability to engage with the aff in order to get tangible offense to fairness

#### C. Semantics collapses to pragmatics- their terminal impact is unpredictability which is based on a pragmatic reading of the res which we meet.

#### Now on their shell

### AT: Academic Freedom ø Speech

#### Academic Freedom is protected under the first amendment

**Jashik 14** [Scott Jaschik is one of the three founders of Inside Higher Ed. With Doug Lederman, he leads the editorial operations of Inside Higher Ed, overseeing news content, opinion pieces, career advice, blogs and other features. Scott is a leading voice on higher education issues, quoted regularly in publications nationwide, and publishing articles on colleges in publications such as The New York Times, The Boston Globe, The Washington Post, Salon, and elsewhere. He has been a judge or screener for the National Magazine Awards, the Online Journalism Awards, the Folio Editorial Excellence Awards, and the Education Writers Association Awards. Scott served as a mentor in the community college fellowship program of the Hechinger Institute on Education and the Media, of Teachers College, Columbia University. He is a member of the board of the Education Writers Association. From 1999-2003, Scott was editor of The Chronicle of Higher Education. Scott grew up in Rochester, N.Y., and graduated from Cornell University in 1985., 2-13-2014, "Court ruling takes stand for faculty free speech," No Publication, <https://www.insidehighered.com/news/2014/02/13/court-ruling-takes-stand-faculty-free-speech>]

A federal appeals court has given a strong endorsement to the idea that faculty speech rights at public colleges and universities were not constrained by a 2006 Supreme Court ruling that limited the rights of some public employees. The 2006 ruling, Garcetti v. Ceballos, concerned the Los Angeles district attorney's office. Despite that, some courts have been applying the ruling to faculty disputes at public universities -- while others have not. The new ruling – by the U.S. Court of Appeals for the Ninth Circuit – comes in a three-judge panel’s revised opinion on the case of David Demers, a tenured professor at Washington State University who says he was retaliated against with negative performance reviews for writings that criticized the administration. The appeals court did not rule on the merits of the case, and as it did in its first look at the Demers suit, it said that his free speech wasn’t limited by the Garcetti ruling. But the language in the new ruling was quite strong – the kind of language many faculty advocates have been looking for. The appeals court acknowledged that Garcetti set limits for public employees, but said there was no question that those limits should not apply in higher education. “Garcetti left open the possibility of an exception,” the appeals court said. “In response to a concern expressed by Justice Souter in dissent, the court reserved the question whether its holding applied to ‘speech related to scholarship or teaching.’ Justice Souter had expressed concern about the potential breadth of the court’s rationale, writing, ‘I have to hope that today’s majority does not mean to imperil First Amendment protection of academic freedom in public colleges and universities.’ ” The appeals court added that “Demers presents the kind of case that worried Justice Souter. Under Garcetti, statements made by public employees ‘pursuant to their official duties’ are not protected by the First Amendment. But teaching and academic writing are at the core of official duties of teachers and professors. Such teaching and writing are a special concern of the First Amendment. We conclude that if applied to teaching and academic writing, Garcetti would directly conflict with the important First Amendment values previously articulated by the Supreme Court.” Further the court noted that the First Amendment, as interpreted in other Supreme Court decisions, applies to faculty speech that may not be strictly scholarship or teaching, but may relate to discussions of college policy. “[P]rotected academic writing is not confined to scholarship,” the appeals court said. “Much academic writing is, of course, scholarship. But academics, in the course of their academic duties, also write memoranda, reports, and other documents addressed to such things as a budget, curriculum, departmental structure and faculty hiring.”

Outweighs:

1. supreme court ruled one way- that sets precedents
2. they are functionally the same, because they express similar types of ideas

### AT: Post

#### 1. Doesn’t draw on actual court cases

#### 2. doesn't mean that academic freedom isn’t a type of utterance. Things like inquiry, discussion and teaching all matter

### AT: Ground/Limits

#### 1. Link Turn- we stop advocacy shift, generic affs can use specific mechanisms to avoid neg DAs, but our advocacy ties us to only one mechanism

#### 2. Link Turn- Research affs are predictable- multiple other teams have been reading them such as Newark, and other teams have been reading research as PICs when negating

#### 3. No ground loss- we prove that your initial interpretation of the topic were wrong so just because you didn’t have any new prep, that doesn’t change what the topic is about.

#### 4. Link Defense- Solvency advocate proves it’s in the lit and you could have checked against it

#### 5. Link Defense- Our Interp doesn’t add many affs, jus tsome research affs- so you should be able to prep them

#### 6. Generics solve- you get any aff that’s relevant to free speech, NCs, Ks, solve

### AT: Can’t Name Grd

#### AT: No Neg Ground:

#### 1. you get DAs about innovation, because patents are important to that.

#### 2. just because you don't get generic topic DAs doesnt mean no ground

#### 3. generics apply

#### 4. any adv. cp's that turn patents, impact turns,

#### 5. peninsula broke a bioterror cp that's literally like more research risks that terrorists will learn more about it

## T “Any”

### I meet

#### I meet the res doesn’t specify whether “speech” is singular- The aff gets to narrow the debate to one TYPE of speech so long as they defend that NO RESTRICTIONS are placed on it.

### CounterInterp

#### CounterInterp: The Aff may spec a single type of CPS if they read a solvency advocate, and it’s disclosed

#### The definition is Slocum 15- Any doesn’t refer to all and can mean subsets

#### Two reasons to prefer:

#### A. Outweighs abstract textuality args because they fail to describe ordinary meanings and aren’t useful

#### B. Real World- Court rulings are the best determiner of how statutes and laws are applied.

#### NOW, Net Benefits

#### 1. Turns + Solves Grammar- the res doesn’t specify whether “speech” is singular-Also no impact- Grammar is fluid- it’s constantly changing which means that there is no objective way to evaluate the standard because acceptable rules differ

#### 2. Depth- focusing on a specific type of free speech maximizes in depth discussion and new innovation on that particular issue. Outweighs: Depth is unique to debate; research, switch side, and multiple rounds provide opportunities for breadth

#### 3. Aff Variability- we are forced to defend a small subset of lit, screws strategic flex cuz whole rez affs get spread out to hyperspecific 1NCs and long 2NRs. Compensates abuse on limits

### SL [:10]

#### Evaluate Strength of link- more offense to ed o/w marginal offense to fairness

#### A. Consistent with long terms goal of debate- education is portable

#### B. Need to prove 100% inability to engage with the aff in order to get tangible offense to fairness

#### C. Semantics collapses to pragmatics- their terminal impact is unpredictability which is based on a pragmatic reading of the res which we meet.

#### Now on their shell

### AT: Pred/Grd/Limits

#### 1. Link Turn- whole res affs lose to hyperspecific pics Their plank that prohibits pics doesn't solve- they’ll read the plank with T in this round but other rounds they will still read PICs. That outweighs: neg's reactive- they have infinite other CPs against a plan but PICs coopt 99% of my ground and force a 1AR restart

#### 2. Link Turn- whole res affs lose to hyperspecific DAs-that outweighs: Less likely to prep them so the neg gets 100% strength of link against them, the 2NR timeskew outweighs 1AR weighing and they utilize a confident link scenario

#### 3. Link Turn- policymakers in the topic write about contextual restrictions not broad bans

#### 4. Link Turn- we stop advocacy shift, generic affs can use specific mechanisms to avoid neg DAs, but our advocacy ties us to only one mechanism

#### 5. Link Defense- there’s a small caselist of plans on the topic- you just chose not to prep: journalism, speech zones, athlete speech, military policies, Zionism

#### 6. Generics and disclosure check- its on the wiki and you get other positions when it’s broken new

### Impact D- Semantics

#### 1. No Jurisdiction claim- just because the judges role is to judge the topic only doesn't mean it ought to be- educational activities require the judge to serve as an educator and competitive activities require fairness which are overarching constitutive founding purposes of the activity that outweigh in round obligations

#### 2. No uq ilink to predictability – we have a definition too and ppl have been reading affs like this – they beg the question

### AT: Nebel

#### Good is good enough – there’s a difference between reading a blatantly non T aff and an aff with a supported definition in the lit, that’s sufficient to solve the implicit predictability impact of nebel

### AT: Almost Test/Precision

#### T/ This is a subjective test of any’s meaning which makes judging subjective –default to empirics. Lallas also can’t prove if the almost test doesn’t work then any is spec and doesn’t prove that any independently can’t refer to one

### AT: Grammar

#### The definition is Slocum 15- Any doesn’t refer to all and can mean subsets, multiple court cases prove that expert usage in the lit IS NOT the same as the grammatical interp which turns ground – that makes us more predictable, grammar is determined by usage

#### 1. Cross apply net benefits and weighing which serves as link turns

#### 2. No Jurisdiction claim- just because the judges role is to judge the topic only doesn't mean it ought to be- educational activities require the judge to serve as an educator and competitive activities require fairness which are bigger obligations

#### 3. No internal link to ground- people interpret the topic commonly so they know what to prep

### AT: Text- Common Usage

#### 1. Turn- ordinary speakers want examples of how policies have been implemented in specific scenarios which are examples like the aff

#### 2. There is no measure for common consenus

#### 3. Experts write the literature – we debate to become experts on a topic not common people

### AT: Read As Advantage

#### 1. That sacrifices complete depth of our argument- because they’d just read a separate framework and a ton of topic based DAs and outweigh rather than having a discussion about athlete rights

#### 2. If hyperspecifcs are equally hard to prep then the debate becomes like two ships passing in the dark with no clash wich is the useful part of depth

### 1AR- Grammar K

#### “Precision” and “grammar” are dangerous forms of language regulation that manipulate rules to institutionalize dominance and violent ideas

**Valdes 97**, 1997 (Francisco, visiting Professor of Law at the Univeristy of Miami Law School, “LatCrit Theory, Outsider Jurisprudence and Latina/o Self=Empowerment”, Harvard Latino Law Review, 2 Harv. Latino L. Rev. 1, 1997, lexis)

The third symposium article, by Steven Bender, focuses on language regulation and "language vigilantism" as sources of Latina/o subordination and targets of LatCrit intervention. [30](https://studysites.sagepub.com/personalitytheoriesstudy/05/resources2.htm?_m=ceccad2b4c3afea1177ea7ee58050a37&docnum=14&_fmtstr=FULL&_startdoc=1&wchp=dGLbVlz-zSkAk&_md5=9a8f5b8e397eaa799bf450cbd33eadf6&focBudTerms=LatCrit&focBudSel=all#n30) Professor Bender shows how "popular initiatives" effectively create hostile social, political and legal environments for Latinas/os and in particular how this form of direct lawmaking licenses a broader array of anti-Latina/o microaggressions. 31 In this way, Professor Bender displays not only the prominence of language-related issues to Latinas/os and LatCrit scholars, he also displays the relationship of law to politics or of rules and doctrines to power and privilege. 32 The terms of the language regulation debate, Professor Bender shows, are riddled with racist and nativist sentiment; the rhetoric and professed aim of the English-Only and Official English movements are monolingual hegemony and English supremacy as adjuncts of Anglo and White dominance. These movements use majoritarian politics to fashion and enact formal legal rules that  [[\*12]](http://www.lexis.com/research/retrieve?_m=ceccad2b4c3afea1177ea7ee58050a37&docnum=14&_fmtstr=FULL&_startdoc=1&wchp=dGLbVlz-zSkAk&_md5=9a8f5b8e397eaa799bf450cbd33eadf6&focBudTerms=LatCrit&focBudSel=all)  institutionalize this dominance as a matter of law, thereby consolidating the power of historically privileged social groups or forces. 33 In this way, Professor Bender effectively employs a contemporary debate -- language, diversity and conformity -- as a case study that shows the direct link between politics, law and subordination. Given this link, critical analyses of the "law" must be cognizant of the politics that produced the status quo; antisubordination scholarship must be "political" if it is to account for and counteract the political nature and slant of the law.

#### This is a voting issue- you should drop them for being a bad form of scholarship

### 2AR- K Weighing

#### 1. Their framework reps are too abstract to do anything, at worst their ethical appeals are nonunique anyways because of the turns and aren’t general enough to solve oppression

#### 2. Real world education is the end goal of all of debate, so it’s a gateway issue in evaluating the merit of arguments so the K precludes since there’s no risk of a prefiat advantage to the AC

#### 3. Questioning assumptions and requiring ethical justification for a inevitable conclusion that oppression is bad is useless and exclusionary to those debaters who face those very issues as they are shaped by them.